

**SATURN'S RINGS.**—Several recent observations of Saturn's rings are reported in No. 4213 (p. 219, November 10) of the *Astronomische Nachrichten*. Dr. Ristenpart reports that on November 5 he was able to see the ring distinctly, as a ghost-like fine line, with the 12-inch equatorial of the Urania Observatory at Berlin.

Prof. Hartwig, observing at Bamberg on November 7, was surprised to find that the ring on both sides appeared of a reddish-brown colour. The shadow of the rings on the surface of the planet was very distinct, and broader than it was four weeks previously. A telegram from Cambridge (Mass.) reports that Prof. Lowell confirms the observation of the symmetrical knots in Saturn's rings made by Prof. Campbell.

In the same journal Herr Paul Guthnick places on record the results of observations of Saturn's rings and satellites made at the Royal Observatory, Berlin, during part of the week referred to by Prof. Campbell.

**ELEMENTS AND EPHEMERIS FOR THE MINOR PLANET PATROCLUS.**—A set of elements and an ephemeris, covering the period October 31 to November 16, for Patroclus (1906 VY), one of the three Jovian asteroids, are given in No. 4212 (p. 193, November 7) of the *Astronomische Nachrichten* by Herr V. Heinrich. The opposition will take place on November 30, the magnitude of the minor planet being 14.5.

**COMPARISONS OF THE PLACES OF MARS FOR THE OPPOSITIONS OF 1907 AND 1909.**—In a paper communicated to the Royal Astronomical Society (Monthly Notices, vol. lxvii., No. 9, p. 575) Dr. Downing compares the places of Mars calculated from Newcomb's tables with the places calculated from Le Verrier's tables near the times of opposition in 1907 and 1909. The results are tabulated for every eight days from May 26 to August 14, 1907, and from August 14 to November 2, 1909. On September 23, 1909 (near the time of opposition), the correction to Le Verrier's place is  $-10.5$  seconds of arc in R.A. and  $-5^{\circ}.5$  in declination, to his heliocentric longitude of Mars  $-4^{\circ}.1$ , and to the longitude of the sun  $-0^{\circ}.9$ ; the distance of Mars from the earth will be 0.39.

### SCIENCE AT THE FRANCO-BRITISH EXHIBITION OF 1908.

It has been announced in various newspapers that there will be a Franco-British Exhibition next year. Those who have passed near Uxbridge Road will have also noticed that a large area of ground is being covered rapidly with exhibition buildings.

According to its prospectus, it is to be an exhibition of science, arts, and industries, and it is a matter of concern to all English men of science to see that in such an exhibition science is given its proper place.

Up to the present time no accounts of any attempt to represent science at this exhibition have been made public; we give, therefore, a short sketch of the efforts which are being made to have a pure science section as a part of the exhibition. Such a section is a novelty in exhibitions, and that there will be a science section is due to the action of the British Science Guild. That body approached the executive committee of the exhibition, suggesting that a section should be set apart for pure science, dealing mainly with original research as carried on both in the laboratory and in factories.

The executive committee accepted the suggestion, and a committee was formed which has been at work since June last.

It is hoped that the French side of the exhibition will deal with French science in a similar way.

The committee is constituted as follows:—Sir Norman Lockyer, K.C.B., F.R.S., chairman; Prof. John Perry, F.R.S., vice-chairman; Sir Alexander Pedler, C.I.E., F.R.S., hon. secretary. Members: Captain Sir Wm. de W. Abney, K.C.B., F.R.S., Prof. J. O. Arnold, Major B. F. S. Baden-Powell, Dr. F. A. Bather, Prof. C. V. Boys, F.R.S., Prof. Callendar, F.R.S., Major Close, R.E., Captain Ettrick-W. Creak, R.N., C.B., F.R.S., Mr. Horace Darwin, F.R.S., Prof. J. A. Ewing, F.R.S., Prof. Farmer, F.R.S., Rear-Admiral Field, F.R.S., Mr. L. Fletcher,

F.R.S., Mr. G. H. Fowler, Sir Archibald Geikie, K.C.B., F.R.S., Sir David Gill, K.C.B., F.R.S., Dr. R. T. Glazebrook, F.R.S., Prof. Gotch, F.R.S., Mr. Walter Rosenhain, Colonel Hellard, R.E.; Colonel Sir Thomas Holdich, K.C.M.G., K.C.I.E., C.B., Sir E. Ray Lankester, F.R.S., Dr. W. J. Lockyer, Prof. R. Meldola, F.R.S., Prof. H. A. Miers, F.R.S., Dr. H. R. Mill, Prof. Milne, F.R.S., Prof. Poulton, F.R.S., Lieut.-Colonel D. Prain, C.I.E., F.R.S., Sir William H. Preece, K.C.B., F.R.S., Sir William Ramsay, K.C.B., F.R.S., Dr. Ridewood, Mr. Frederick Rudler, I.S.O., Prof. Rutherford, F.R.S., Dr. W. N. Shaw, F.R.S., Mr. A. E. Shipley, F.R.S., Mr. L. J. Spencer, Dr. J. J. H. Teall, F.R.S., Prof. Silvanus Thompson, F.R.S., Prof. T. E. Thorpe, C.B., F.R.S., Prof. Trouton, F.R.S., Colonel Sir Charles M. Watson, R.E., K.C.M.G., C.B., Sir H. Trueman Wood.

The exhibits are for convenience subdivided into three sections:—

(a) Historical apparatus which has been used by eminent scientific discoverers, or has been the means of elucidating important truths.

(b) Instruments and methods used in experiments and observations, including those used in laboratory and works research.

(c) Instruments and methods used in and results obtained from the exploration of (1) the land; (2) the sea; (3) the air; (4) the heavens.

The various subjects are dealt with as follows:—

Division 1: arithmetic and mathematical science, geometry, measurement, molecular physics, and sound. Subcommittee, Prof. Perry, Prof. C. V. Boys, and Mr. Horace Darwin; convener, Prof. Perry.

Division 2: light and photography. Subcommittee, Captain Sir Wm. de W. Abney and Sir H. T. Wood; convener, Sir H. T. Wood.

Division 3: invisible radiations. Subcommittee, Prof. S. P. Thompson, Prof. Rutherford, and Hon. R. J. Strutt; convener, Prof. Rutherford.

Division 4: heat. Subcommittee, Prof. Callendar and Mr. Horace Darwin; convener, Prof. Callendar.

Division 5: magnetism and electricity. Subcommittee, Prof. S. P. Thompson, Prof. Trouton, and Sir Wm. H. Preece; convener, Prof. Trouton.

Division 6: chemistry. Subcommittee, Prof. Thorpe, Prof. Meldola, Sir Wm. Ramsay, and Sir Alex. Pedler; convener, —.

Division 7: mineralogy and crystallography. Subcommittee, Prof. Miers, Dr. Fletcher, and Mr. L. J. Spencer; convener, Prof. Miers.

Division 8: animal biology. Subcommittee, Sir E. Ray Lankester, Prof. Gotch, Mr. A. E. Shipley, Prof. Poulton, and Dr. Ridewood; convener, Prof. Gotch.

Division 9: vegetable biology. Subcommittee, Lieut.-Colonel D. Prain and Prof. Farmer; convener, Prof. Farmer.

#### (1) Exploration of the Land.

Division 10: geography. Subcommittee, Sir D. Gill, General Sir T. Holdich, Prof. J. Milne, Colonel Sir Charles M. Watson, Colonel Hellard, and Major Close; convener, Colonel Sir C. M. Watson.

Division 11: geology. Subcommittee, Sir Archibald Geikie, Dr. J. J. H. Teall, Mr. F. Rudler, and Dr. F. A. Bather; convener, Mr. F. Rudler.

#### (2) Exploration of the Sea.

Division 12: oceanography and hydrography. Subcommittee, Rear-Admiral Field, Captain Creak, Mr. G. H. Fowler, and Mr. D. J. Matthew; convener, Captain Creak.

#### (3) Exploration of the Air.

Division 13: meteorology. Subcommittee, Dr. Shaw, Dr. Mill, and Major Baden-Powell; convener, Dr. Shaw.

#### (4) Exploration of the Heavens.

Division 14: astronomy. Subcommittee, Sir D. Gill, Sir Norman Lockyer, and Dr. Lockyer; convener, Dr. Lockyer.

Division 15: geodesy. Subcommittee, Committees 10 and 14 sitting together; convener, Major Close.

Division 16: metallography. This additional subsection

has only lately been formed, and should have been included between subsections 6 and 7 (chemistry and mineralogy and crystallography). Subcommittee, Prof. Arnold, Prof. J. A. Ewing, Mr. Walter Rosenhain, and Mr. J. E. Stead; convener, Mr. Walter Rosenhain.

It is hoped that everyone interested in the welfare of science will materially assist the committee, the work of which is a labour of love. Such help, in the form of the loan of objects, photographs, &c., of scientific interest which they may possess, will add greatly to the value of the sections. The conveners of each section will gladly communicate with such intending exhibitors if applications be made to them through the main office (56 Victoria Street, S.W.).

### THE EXTINCT VERTEBRATE FAUNA OF PATAGONIA.<sup>1</sup>

IF eccentric originality stand for genius, and refusal to follow the beaten track, even when compass-bearings indicate that it is the right one, be deemed merit, then, unquestionably, the author of the work before us is entitled to stand in the first rank of scientific men. If, on the other hand—but perhaps it will be better to leave our readers to complete this sentence as their own judgment dictates after the perusal of the following remarks and criticisms.

Dr. Ameghino was, it seems, engaged on a monograph on Patagonian fossil fishes, when the appearance of an article by Mr. O. Wilckens on the Cretaceous and Tertiary strata of Patagonia led him to direct his attention to the task of confuting the (to him) heterodox views therein expressed. The result is the present bulky volume, which comprises within its purview a survey of the whole of the vertebrate-bearing strata of Patagonia, together with a summary of the author's views with regard to their geological ages and the relationships and phylogenies of their faunas.

So far as vertebrate palæontology is concerned, Dr. Ameghino has long been imbued with the idea that the Argentine Republic (like Boston in another sense) is the "hub of the universe." In previous works he has demonstrated to his own satisfaction that South America was the birth-place of every mammalian group save that typified by man. He now goes one better, and claims that even *Homo sapiens* himself traces his ancestry to the great South American birthplace and nursery of creation, where he was represented by "*Homo pampeanus*" in the reputed Lower Pliocene strata of Mar del Plata.

There was, however, we are told, a yet earlier forerunner of the human race in Patagonia, to wit, the still apparently unknown *Homosimius* of the Lower Miocene or Oligocene, and it was this hypothetical creature which passed from South America by a land-bridge across the Atlantic, in company with *Cercopithecidae*, to colonise the Old World, where the more bestial man-like apes made their appearance at a later date as a lateral offshoot from the human stock. Finally, to go still further back, the whole order of the Primates (not to mention other mammalian groups) traces its descent to the Argentine *Microbiotherium*, which the prosaic palæontologists of other countries persist in regarding as neither more nor less than an aberrant type of opossum. We have thus the direct descent of man from marsupials, in defiance of the accepted view that marsupials and placentals are not in the same line.

The above is merely one example from among many elaborate mammalian phylogenies to be met with in this volume; all, if we may say so, evolved from the author's fertile imagination rather than based on any tangible foundation of fact—or, at least, upon any that is apparent to ourselves.

To put the matter briefly, it may be said that whereas most palæontologists of repute who have practical acquaintance with the country or its fossils, or with both together, see in the Patagonian sequence a series of

<sup>1</sup> "Les Formations sédimentaires du Crétacé Supérieur et du Tertiaire de Patagonie, avec un parallèle entre leurs Faunes mammalogiques et celles de l'Ancien Continent." By Florentino Ameghino. Pp. 568+plates. Buenos Aires An. Museo Nacional, vol. xv. (1906.)

Cretaceous strata with dinosaurian remains followed, after an interval, by others containing one or two mammalian faunas of apparently Miocene age, Dr. Ameghino recognises in the lower beds a mingled mammalian and dinosaurian Cretaceous fauna, succeeded by several distinct mammalian faunas extending from the Eocene upwards. Nor is this all, for while those who do not accept his views consider that the exclusively Patagonian extinct mammalian fauna (and more especially the Ungulate) is *sui generis* and strictly local, the author is of opinion that the various faunas recognised by himself present numerous ramifying affinities with practically all the other Tertiary faunas of 'the globe, of which, indeed, he regards the former as the *fons et origo*.

It is, however, only fair to add that at the commencement of the volume Dr. Ameghino puts these two irreconcilable views candidly before his readers, and if he elects, in opposition to, practically, the united opinion of the rest of the palæontological world, to adhere to the second alternative, he has, of course, a perfect right to do so. To attempt to refute his views by summarising and criticising the evidence would manifestly be impossible within the limits of a single short article, and it must accordingly suffice to reiterate emphatically that they are not endorsed by even a respectable minority of expert opinion elsewhere.

It may, however, be well to refer to a couple of instances (in addition to those already cited) of what we venture to call Dr. Ameghino's idiosyncrasies in the matter of classification and phylogeny. European palæontologists, after very careful study, have arrived at the conclusion that the remarkable Eocene Egyptian ungulate *Arsinoitherium* either represents a special group of the order by itself or that it is an aberrant hyrax. Our author scouts both these opinions, and without any apparent reason refers the genus to the Ancylopoda, as typified by the European *Chalicotherium* (*Macrotherium*). Again, if there is one apparently well-established fact in palæontology it is that the Egyptian *Moeritherium* is on the direct ancestral line of the modern Proboscidea. In this, according to our author, palæontologists are, however, altogether wrong, and instead of Africa having been the birthplace of the elephants, we are to look for this in South America, whence, by some unexplained magic, various (shall we say imaginary?) genera with almost unpronounceable names blossomed on the one hand into *Palæomastodon* and the elephants, and on the other into the forlorn and childless *Moeritherium*.

To enter into further details would be mere waste of space, and it must suffice to add, in conclusion, that, while fully appreciating the great industry Dr. Ameghino has displayed in collecting and describing the palæontological marvels of Patagonia, we sincerely regret our inability to accord him that encomium on the results of his labours which it would have been a real pleasure to bestow.

R. L.

### HYDROLOGY IN THE UNITED STATES.

WE have been favoured by the Department of the United States Geological Survey with seven<sup>1</sup> more papers on the geology and water resources of various States. Most of these, although containing valuable information on such subjects as underground water supplies, rainfall and stream flow, pollution and its relation to typhoid fever, weir experiments as to the measurement of running water, are principally of local interest.

Paper No. 194, on the pollution of the Illinois and Mississippi Rivers by Chicago sewage, by Marshall O.

<sup>1</sup> "The Geology and Water Resources of the Western Portion of the Panhandle of Texas." By C. Gould. Water Supply and Irrigation Paper, No. 191.

"The Water Supply of Nome Region, Seward Peninsula." By J. C. Holt and F. Henshaw. Paper No. 196.

"Underground Waters of the Coastal Plain of Texas." By T. U. Taylor. Paper No. 190.

"Potomac River Basin." By Parker, Willis, Bolster and Marsh. Paper No. 192.

"The Quality of Surface Waters in Minnesota." By Wesbraat. Paper No. 193.

"Weir Experiments, Coefficients and Formulas." By R. E. Horton. Paper No. 200. (Washington: Government Printing Office, 1907.)